SRP network helps parents understand vapor intrusion in schools

By Carol Kelly

NIEHS-funded experts on vapor intrusion joined a meeting Feb. 9 in Winston-Salem, North Carolina, to educate communities in two schools located over contaminated groundwater about potential health effects of chemical exposures.

After learning that harmful chemicals could be seeping into the air inside Hanes Magnet and Lowrance Middle Schools, parents were naturally concerned about the effects of air quality on their children's health. During the meeting with parents and school officials, grantees from the NIEHS Superfund Research Program (SRP), answered questions about the chemicals and the process of vapor intrusion into classrooms at the schools.

"This event serves as a model for community engagement in response to serious environmental health situations, and it reinforces the value of research networks that incorporate scientific information from health and engineering fields," said Heather Henry, Ph.D., a health science administrator for the NIEHS SRP. "This assistance effort — from the discovery to the parents' forum — unfolded within a matter of weeks. It would not have happened without existing networks among the SRP Centers."

The public learned that the schools sit above groundwater containing the chemicals trichloroethylene and tetrachloroethylene as the school district was considering plans to build a new facility at the site. Both chemicals are industrial de-greasers — previously used at a factory across the street from the schools — that are linked to several illnesses and considered by the U.S. Environmental Protection Agency (EPA) as likely to cause cancer. The process by which chemicals turn into gaseous substances and rise and enter indoor air is called vapor intrusion (see sidebar).

Calling in a network of experts

To provide parents with expert advice, Kathleen Gray, the research translation leader for the University of North Carolina at Chapel Hill (UNC) SRP, coordinated input from the following scientists:

- Kelly Pennell, Ph.D., a vapor intrusion researcher from the University of Kentucky SRP *(http://www.uky.edu/Research/Superfund/)*
- Wendy Heiger-Bernays, Ph.D., an environmental health professor with the Boston University SRP *(http://www.busrp.org/)*
- Lenny Siegel, executive director of the Center for Public Environmental Oversight *(http://www.cpeo.org/)*, where he educates communities on vapor intrusion detection and cleanup

"This coordinated effort to provide technical assistance represents how well the SRP functions as a research-focused, solution-oriented program," said William Suk, Ph.D., director of the SRP at NIEHS. "It really helped the community to have environmental health experts from three grantees available to help fill knowledge gaps."

Weighing options

In Winston-Salem, the decisions at hand involved whether to relocate students and whether to construct a new facility on a site with known vapor intrusion. "Decision making can be complicated by a lack of data to determine the risk for toxic exposure," said Pennell. "The real challenge of dealing with vapor intrusion is having to make a decision in real time when you don't have all the information you need."

Vapor intrusion

EPA defines vapor intrusion *(http://www.epa.gov/ada/gw/vapor.html)* as the migration of vapors from volatile compounds into occupied buildings, from underlying contaminated groundwater or soil. Assessment methods include sampling groundwater, soil gas, and indoor air, but determining environmental risk is complex. For instance, indoor air concentrations are known to fluctuate daily, so assessing long-term exposures using samples that are collected only a few times can be difficult. In addition, sources of chemicals detected in indoor air can be uncertain, due to the use of consumer products that contain the same chemicals as the vapor intrusion.

Vapor intrusion can be a challenging environmental and health issue for regulators, industry leaders, and concerned residents alike.

From left, Pennell, Gray, Kat Bawden, UNC research translation team member, Siegel, Henry, Traci Connor, a parent who organized the event, and Dana Haine, UNC research translation team member, posed together at SciWorks museum, where the community meeting was held. (Photo courtesy of Heather Henry)

After weighing options and considering available risk assessment information and public opinion, the school board decided to close the schools in question and relocate students. More extensive environmental testing will be conducted to inform future use of the site.

“We will continue dialogue with community members and have offered to help interpret future sampling data as it becomes available,” said Gray. “Also, because it is often difficult for the public to sift through what can be overwhelmingly complex information, we’ve already set up a page on our UNC website *(http://sph.unc.edu/superfund-pages/srpresources/vapor-intrusion-resources/)* that provides this community and others with a one-stop-shopping information resource about vapor intrusion.”

(Carol Kelly is a science writer with MDB Inc., a contractor for the NIEHS Division of Extramural Research and Training.)

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